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Product Information

To:

Product Name: M140NWR2 R0

Document Issue Date: 2010/07/12

Note: 1. Please contact InfoVision Company. before designing your product based on this product.
2. The information contained herein is presented merely to indicate the characteristics and performance of our products. No responsibility is assumed by IVO for any intellectual property claims or other problems that may result from application based on the module described herein.

FQ-7-30-0-009-02C

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Revision	Date	Page	Old Description	New Description	Remark
00	2010/03/15	All	--	First issued	
01	2010/06/18	12	V_DBC_EN High min: 1.5V V_CE_EN High min: 1.5V	Modify to: V_DBC_EN High min: 2.5V V_CE_EN High min: 2.5V	
			PLED max : 3.36W	Modify PLED max: 3.6W	
02	2010/07/12	21	Power sequence definition	Modify power sequence definition	

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1.0　General Descriptions

1.1　Introduction

The M140NWR2 is a color active matrix thin film transistor (TFT) liquid crystal display (LCD) that uses amorphous silicon TFT as a switching device. It is composed of a TFT LCD panel, a timing controller, voltage reference, common voltage, column driver, and row driver circuit. This TFT LCD has a 14.0-inch diagonally measured active display area with resolution (1,366 horizontal by 768 vertical pixel array).

1.2　Features

■ 14.0" TFT LCD Panel
■ LED Light-bar Backlight System
■ Supported (1,366x768 pixels) resolution
■ Compatible with RoHS standard
■ With color engine function

1.3 Product Summary

Items	Specifications	Unit
Screen Diagonal	14.0	Inch
Active Area	309.399 (H) x 173.952 (V)	mm
Pixels H x V	1,366 x3(RGB) x 768	
Pixel Pitch	0.2265×0.2265	mm
Pixel Arrangement	R.G.B. Vertical Stripe	
Display Mode	Normally White	
White Luminance	200 (Typ.) 5 Points Average	cd /m^2
Contrast Ratio	500 (Typ.)	
Response Time	8 (Typ.)	msec
Input Voltage	3.3 (Typ.)	V
Power Consumption	4.8 (Max.)	watt
Weight	350(Max.)	g
Outline Dimension	323.5(Typ.) ×192.0(Typ.) ×5.2 (Max.)	mm
Electrical Interface (Logic)	Single LVDS	
Support Color	262 K	
Optimum Viewing Direction	6 o'colok	
Surface Treatment	Glare+HC	

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1.4 Functional Block Diagram

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Figure 1 Shows the functional block diagram of the LCD module.

Figure 1 Block Diagram
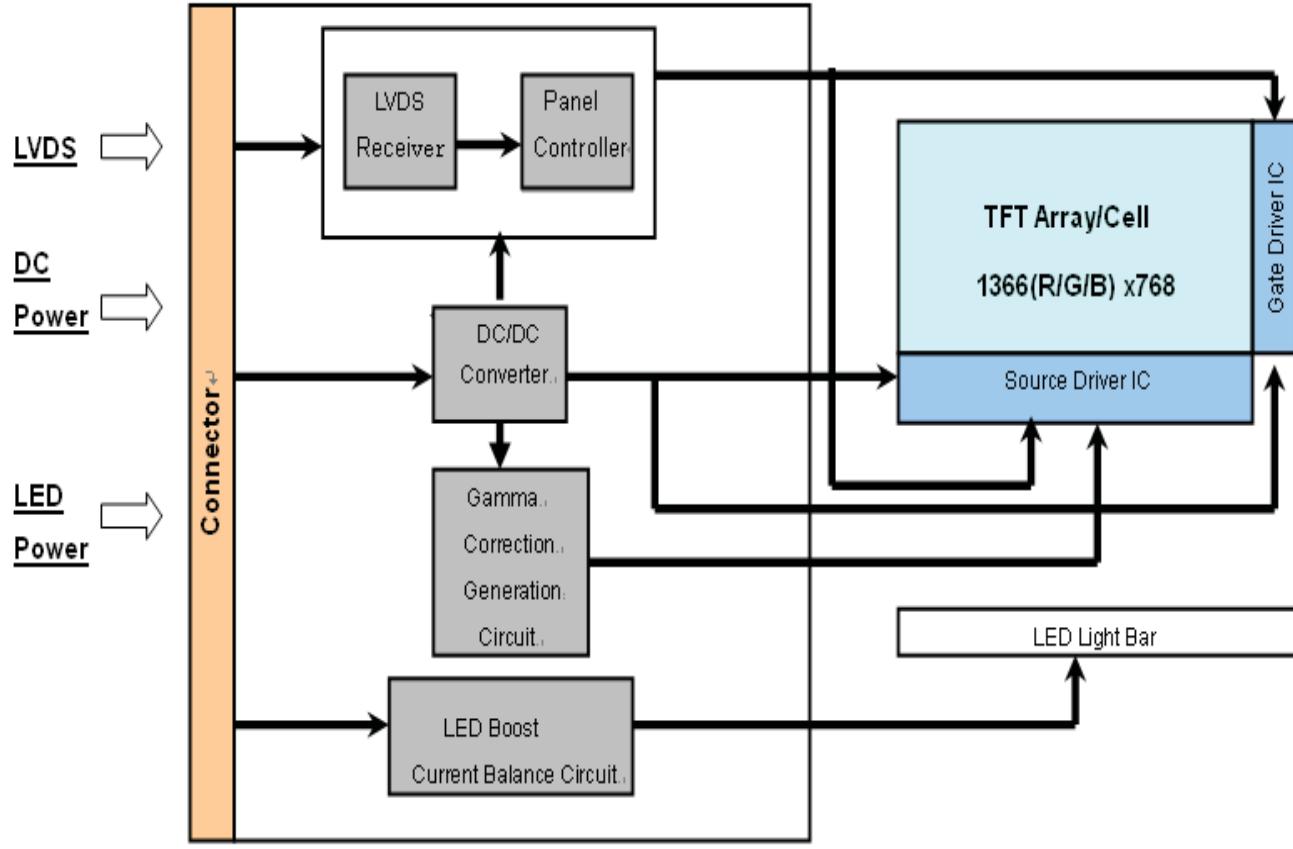
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2.0 Absolute Maximum Ratings

Table 1

Item	Symbol	Min.	Max.	Unit	Conditions
Supply Voltage	VDD	-0.5	4.0	V	-
Supply V_LED Voltage	V_LED	6	21	V	
Input Signal	-	-0.5	2.6	V	LVDS signals
Operating Temperature	TOP	0	50	deg. C	(Note)
Operating Humidity	HOP	10	80	%RH	(Note)
Storage Temperature	TST	-20	60	deg. C	(Note)
Storage Humidity	HST	10	90	%RH	(Note)
Vibration	-	-	1.5G 10-500Hz Random	G Hz	30Mins for X, Y, Z axis
Shock	-	-	220G 2ms	G ms	Half sign wave

Note　(1) Maximum Wet-Bulb should be 39 degree C. No condensation.
　　　(2) When you apply the LCD module for OA system. Please make sure to keep the temperature of LCD module is less than 60℃
　　　(3) Storage /Operating temperature

Figure 2:
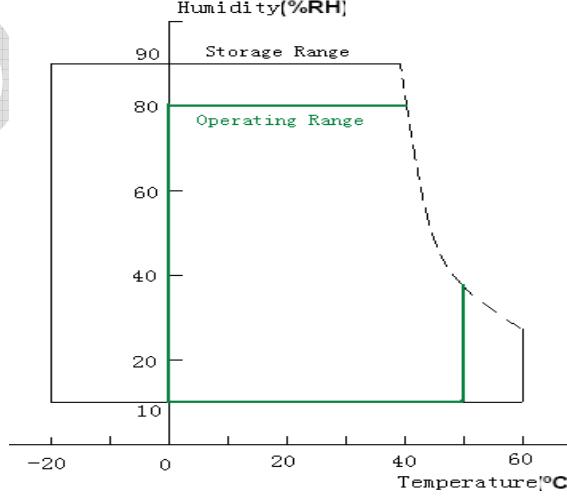
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3.0 Pixel Format Image

Figure 3 shows the relationship of the input signals and LCD pixel format image.

Figure 3 Pixel Format
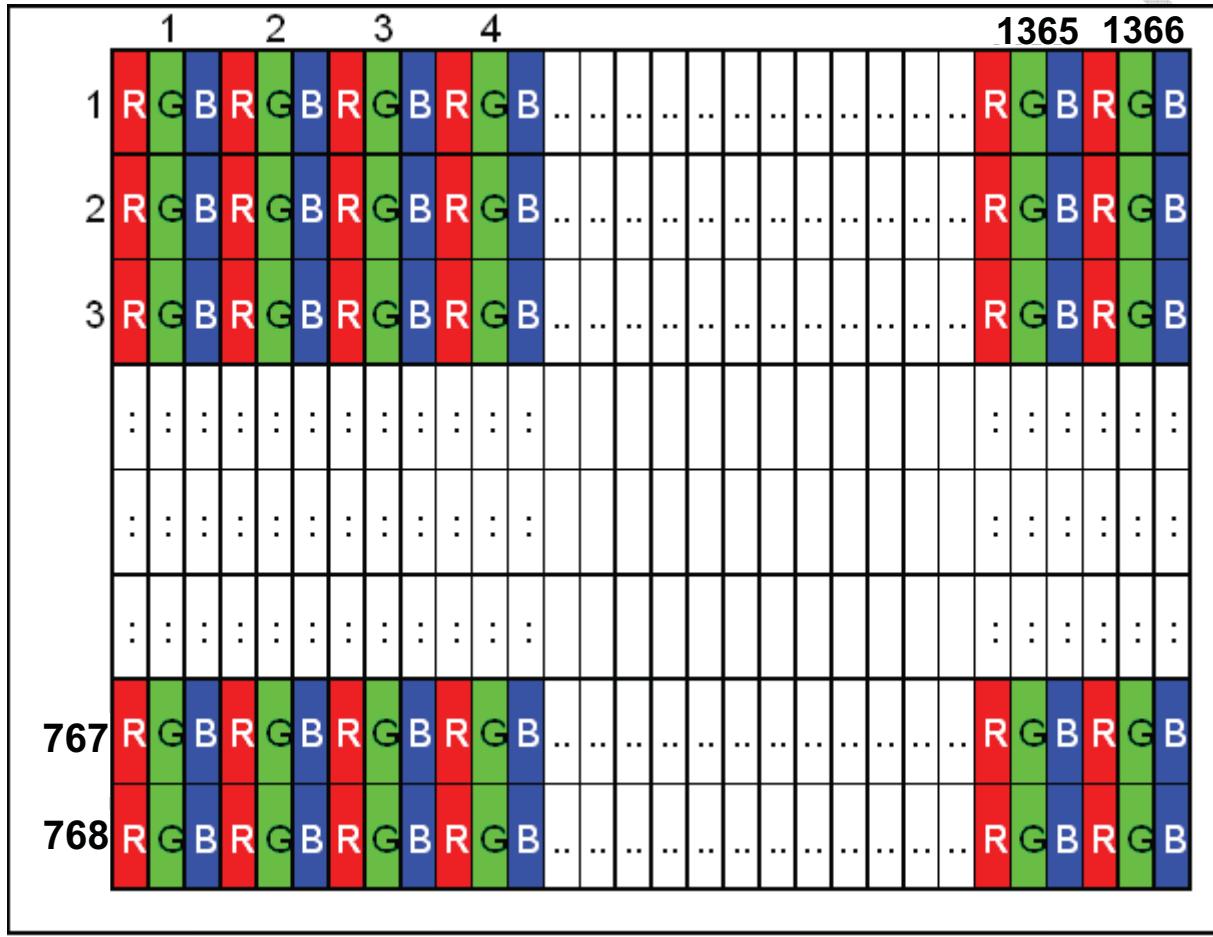
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4.0　Optical Characteristics

The optical characteristics are measured under stable conditions as following notes

Table 2 Optical Characteristics

Item	Conditions		Specification			
			Min.	Typ.	Max.	Note
Viewing Angle [degrees] K=Contrast Ratio>10	Horizontal	Left	40	45	-	A, B,C
		Right	40	45	-	
	Vertical	Up	10	15	-	
		Down	30	35	-	
Contrast Ratio	Center		400	500		A, B,D
Response Time [ms]	Rising +Falling		-	8	12	A,B,E
Color Chromaticity (CIE1,931)	Red　　x			0.590		A,B
	Red　　y			0.345		A,B
	Green　x		Typ. -0.03	0.340	Typ. +0.03	A, B
	Green　y			0.570		A, B
	Blue　　x			0.150		A, B
	Blue　　y			0.120		A, B
	White　x		0.263	0.313	0.363	A, B
	White　y		0.279	0.329	0.379	A, B
White Luminance [cd/m^2]	-		170	200	-	5Points A,B, F
Luminance Uniformity [%]	13Points		67	-	-	A,B, G
	5Points		80	-	-	

Note: A. Measurement Setup:

The LCD module should be stabilized at given temperature for 15 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting backlight for 15 minutes in a windless room.

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Figure 4 Measurement Setup
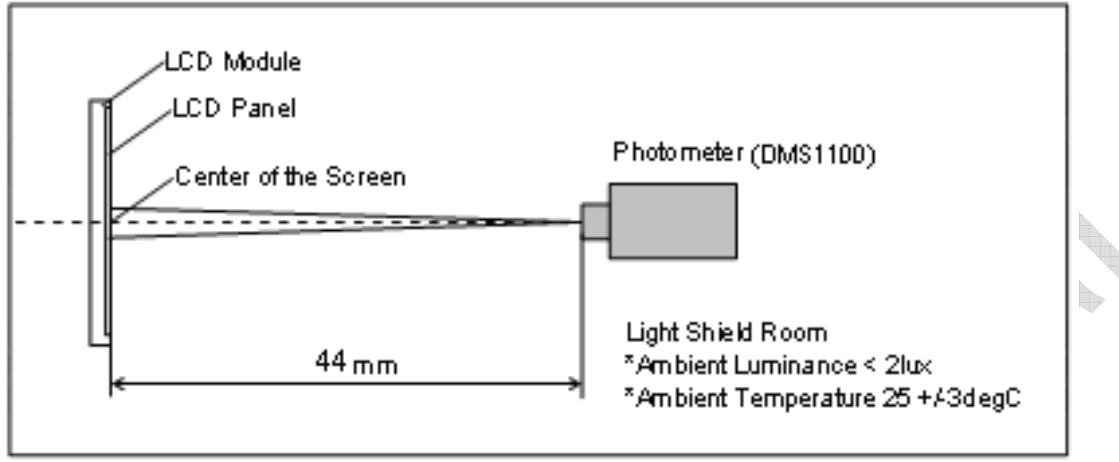
B. The LED input parameter setting as:

   V_LED: 12V (±0.1V)

   PWM_LED: duty 100 %

C. Definition of Viewing Angle

Figure 5 Definition of Viewing Angle
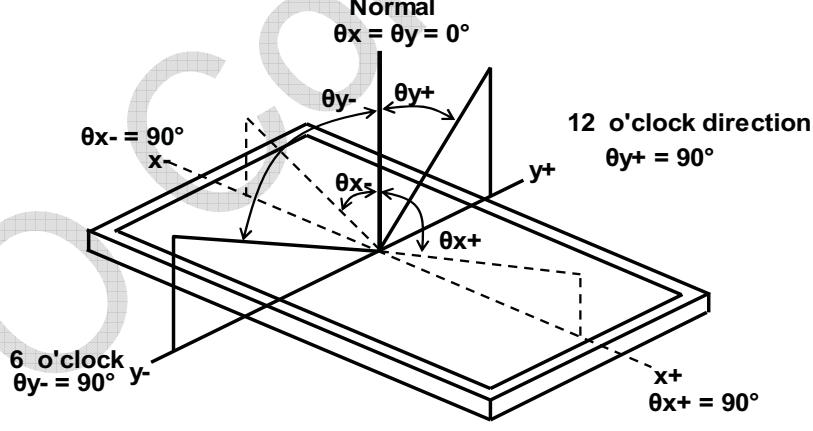
D. Definition Of Contrast Ratio (CR)

   The contrast ratio can be calculated by the following expression

   Contrast Ratio (CR) = L63 / L0

   L63: Luminance of gray level 63, L0: Luminance of gray level 0

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E. Definition Of Response Time (T_R, T_F)

Figure 6 Definition of Response Time
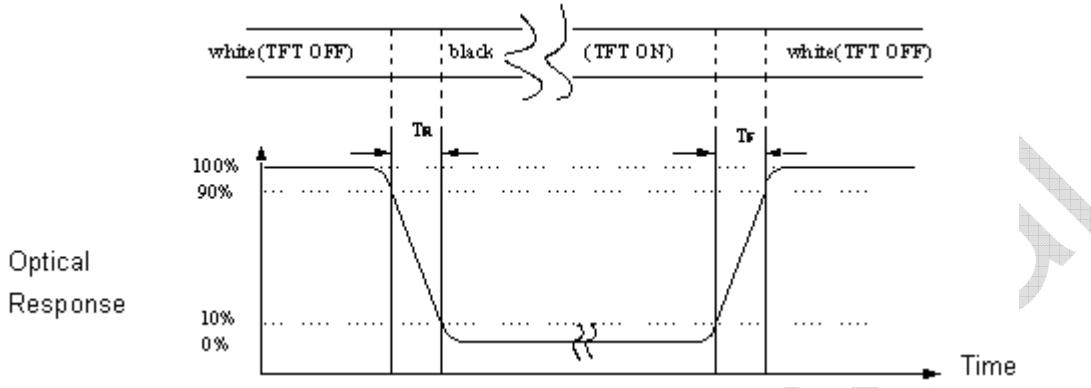
F. Definition Of Luminance White

Measure the luminance of gray level 63 at center point

$$\text{Display Luminance} = \frac{1 + 2 + 3 + 4 + 5}{5}$$
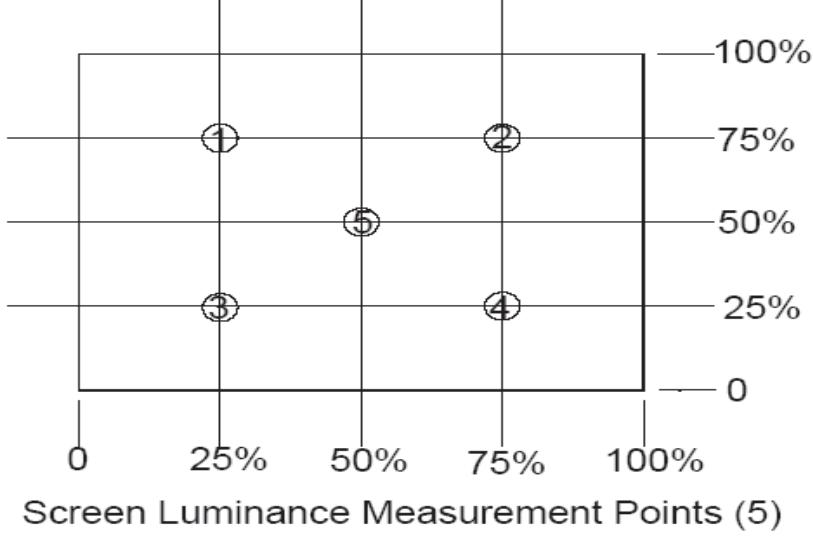
Screen Luminance Measurement Points (5)

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G. Definition Of Luminance Uniformity(Variation)

Measure the luminance of gray level 63 at 13 points.

$$\text{UNF(13pts)} = \frac{\min(L1, L2, \cdots L13)}{\max(L1, L2, \cdots L13)}$$

Figure 7 Measurement Locations Of 13 Points
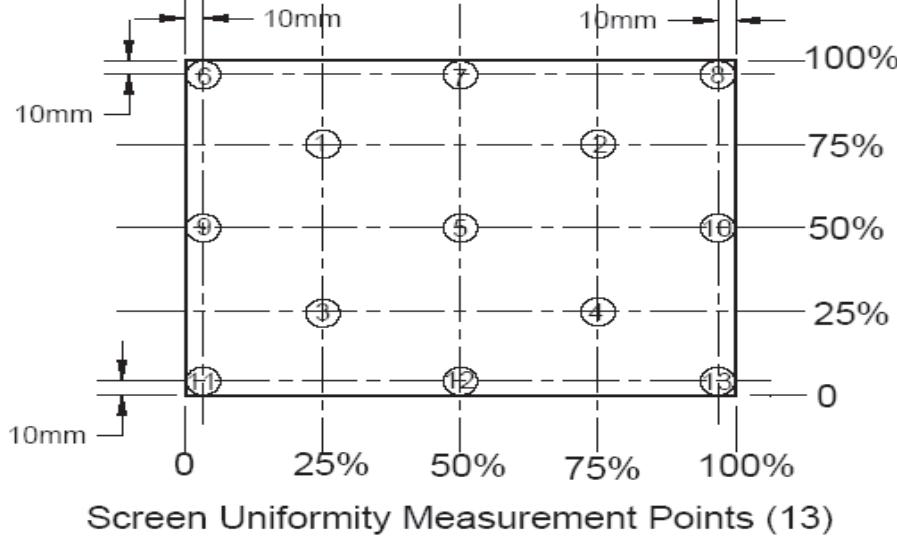
Screen Uniformity Measurement Points (13)

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5.0 Backlight Characteristics

5.1 Parameter Guideline Of LED Backlight

Table 3 Parameter Guideline for LED Backlight

Symbol	Parameter		Min.	Typ.	Max.	Units	Condition
V_LED	LED Input		6	12	21	[V]	Ta=25[deg A] Note A, B
PLED	LED Power Consumption		-	3.16	3.6	W	Ta=25[deg A]
V_PWM	PWM Signal Voltage	High	2.5	-	5.5	V	-
		Low	-	-	0.5	V	
FPWM	Input PWM Frequency		100	200	1K	Hz	-
V_DBC	DBC Voltage	High	2.5	3.3	3.6	V	Ta=25[deg A]
		Low	0	-	0.5		
V_CE	Color Engine Voltage	High	2.5	3.3	3.6	V	Ta=25[deg A]
		Low	0	-	0.5		
V_EN_LED	LED Enable Voltage	High	2.0	3.3	5.5	V	-
		Low	0	-	0.5		
LT	LED Life Time		10,000	-	-	Hours	Ta=25[deg A] Note A
PWM	Duty Ratio -		5	-	100	%	-

Note A: The LED life time define as the estimated time to 50% degradation of initial luminous.

Note B: Strong propose to set LED Input Voltage 12V, it would be best power efficiency.

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6.0 Electrical Characteristics

6.1 Interface Connector

Table 4 Connector Name / Designation

Manufacturer	UJU(or equivalent)
Type / Part Number	IS050-L40B-C10
Mating Receptacle/Part Number	IPEX 20453-040T-11

Table 5 Signal Pin Assignment

Pin #	Signal Name	Description	Remarks
1	NC	Not connected(Reserve)	-
2	VDD	Power supply 3.3V(typical)	-
3	VDD	Power supply 3.3V(typical)	-
4	VDD_EDID	Power supply for EDID	-
5	Test	Panel Self Test-BIST	-
6	SCL	EDID clock	-
7	SDA	EDID data	-
8	RX_0-	LVDS differential data input	-
9	RX_0+	LVDS differential data input	-
10	GND	Ground	-
11	RX_1-	LVDS differential data input	-
12	RX_1+	LVDS differential data input	-
13	GND	Ground	-
14	RX_2-	LVDS differential data input	-
15	RX_2+	LVDS differential data input	-
16	GND	Ground	-
17	RX_CLK-	LVDS differential clock input	-
18	RX_CLK+	LVDS differential clock input	-
19	CE	Color Engine EN(High Enable)	-
20	NC	Not connected(Reserve)	-
21	NC	Not connected(Reserve)	-
22	GND	GND	-
23	NC	Not connected(Reserve)	-
24	NC	Not connected(Reserve)	-
25	GND	GND	-

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26	NC	Not connected(Reserve)	-
27	NC	Not connected(Reserve)	-
28	GND	GND	-
29	NC	Not connected(Reserve)	-
30	NC	Not connected(Reserve)	-
31	LED_GND	LED Ground	-
32	LED_GND	LED Ground	-
33	LED_GND	LED Ground	-
34	NC	Not connected(Reserve)	-
35	PWM_LED	System PWM Signal Input	-
36	LED_EN	LED enable pin	-
37	DBC_EN	Dynamic Backlight Control(High Enable)	-
38	V_LED	LED Power Supply	-
39	V_LED	LED Power Supply	-
40	V_LED	LED Power Supply	-

Note: All input signals shall be low or Hi-Z state when VDD is off.

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6.2 LVDS Receiver

6.2.1   Signal Electrical Characteristics For LVDS Receiver

The built-in LVDS receiver is compatible with (ANSI/TIA/TIA-644) standard.

Table 6 LVDS Receiver Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Differential Input High Threshold	Vth	-	-	+100	mV	Vcm=+1.2V
Differential Input Low Threshold	Vtl	-100	-	-	mV	Vcm=+1.2V
Magnitude Differential Input Voltage	|Vid|	100	-	600	mV	-
Common Mode Voltage	Vcm	|Vid|/2+0.6	1.2	1.8-|Vid|/2	V	-
Common Mode Voltage Offset	∆Vcm	-	-	50	mV	Vcm=+1.2V

Note:

A. Input signals shall be low or Hi-Z state when VDD is off.

B. All electrical characteristics for LVDS signal are defined and shall be measured at the interface connector of LCD.

Figure 8 Voltage Definitions

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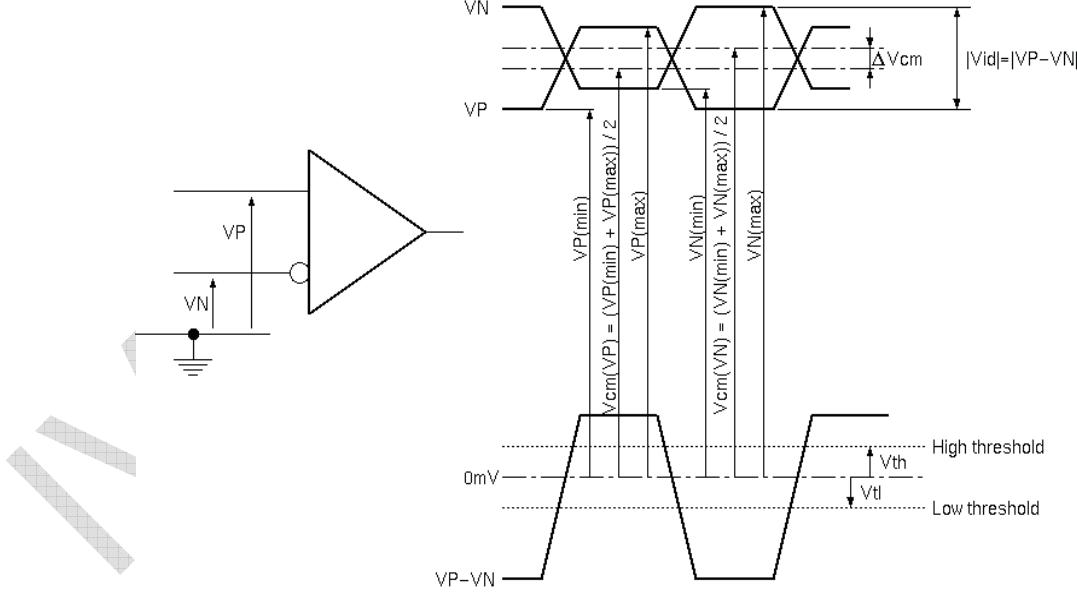
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Figure 9 Measurement System

Figure 10 Data Mapping

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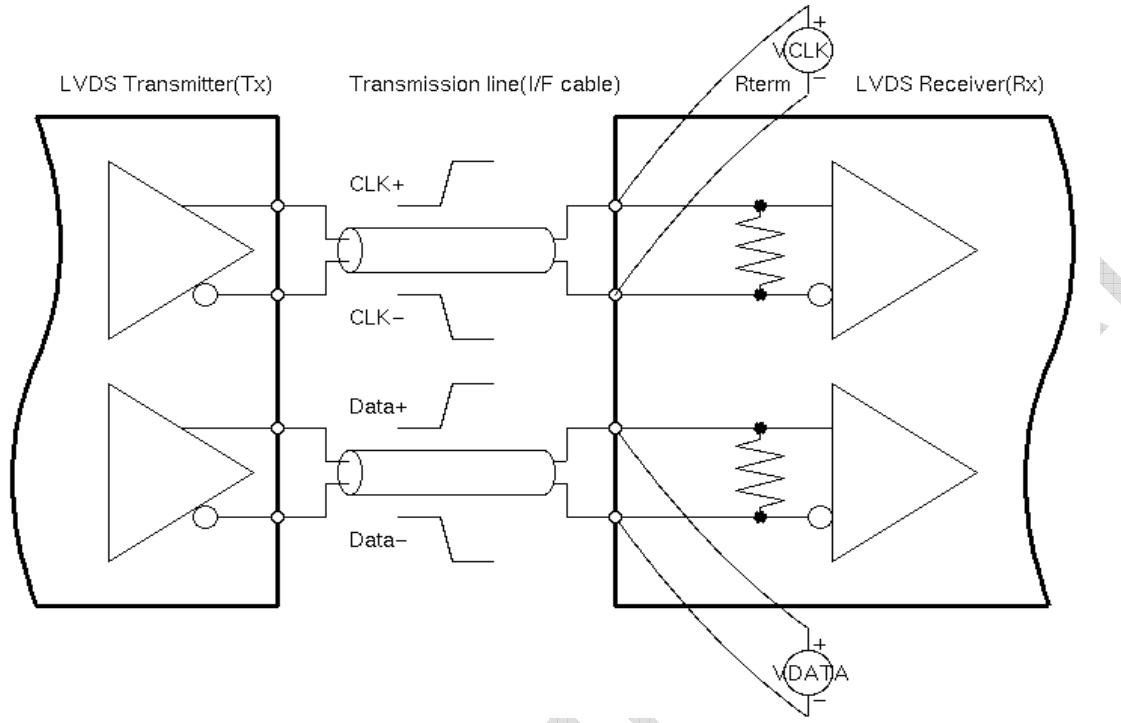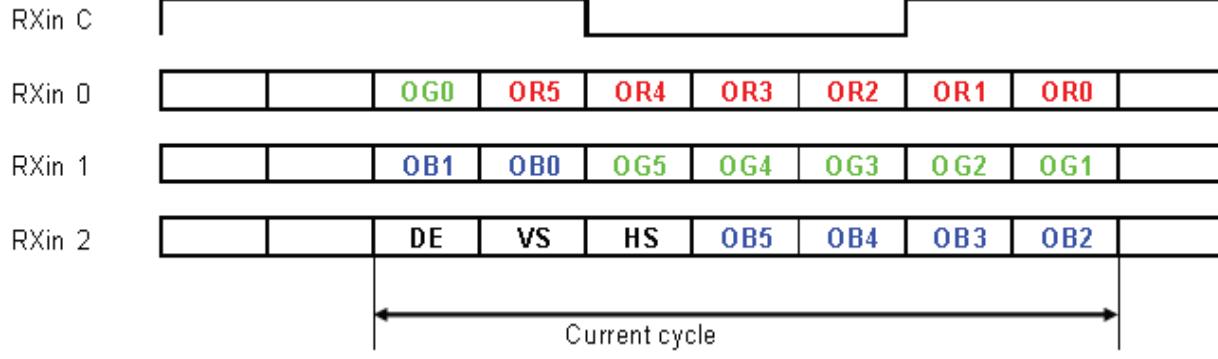
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6.2.2   LVDS Receiver Internal Circuit

Figure 11 LVDS Receiver Internal Circuit

Shows the internal block diagram of the LVDS receiver. This LCD module equips termination resistors for LVDS link.

Figure 11 LVDS Receiver Internal Circuit
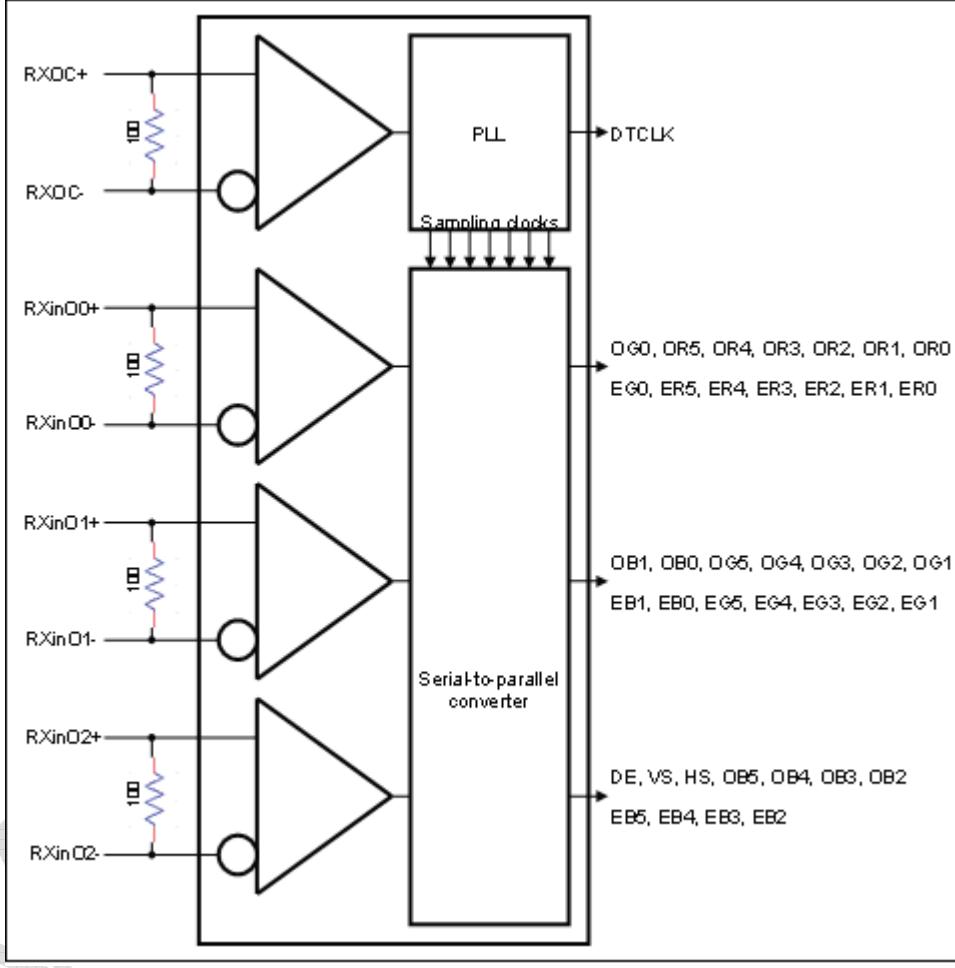
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7.0 Interface Timings

7.1 Timing Characteristics

Table 7 Interface Timings

Parameter	Symbol	Unit	Min.	Typ.	Max.
LVDS Clock Frequency(single)	Fdck	MHz	65	77.9	85
H Total Time	Htotal	Clocks	1396	1,606	2047
H Active Time	Hac	Clocks	1,366	1,366	1,366
V Total Time	Vtotal	Lines	776	808	1023
V Active Time	Vac	Lines	768	768	768
Frame Rate	Vsync	Hz	55	60	65

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Figure 12 Timing Characteristics
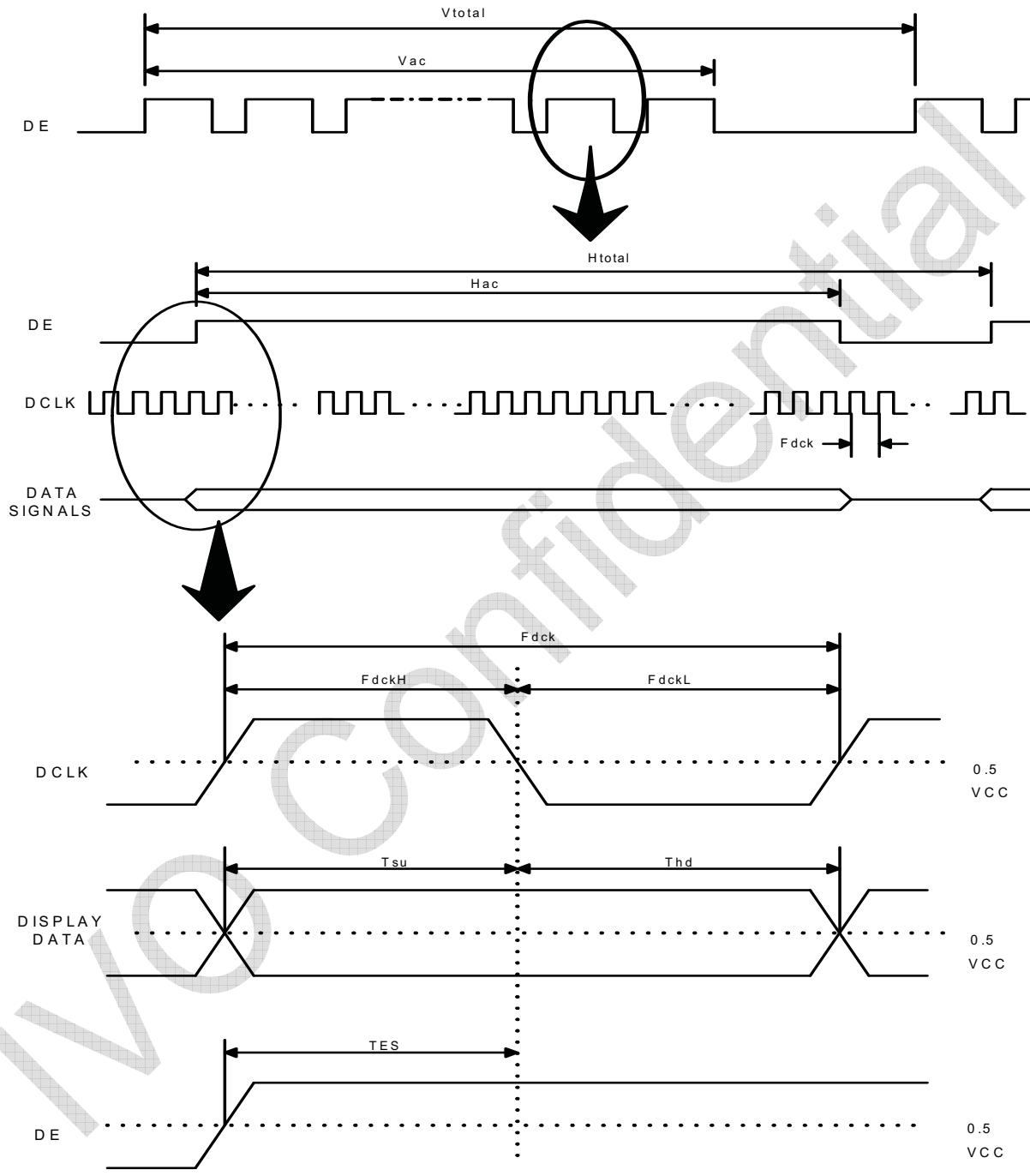
Note: TES is data enable signal setup time.

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8.0 Power Consumption

Input power specifications are as follows.

Table 8 Power Consumption

Symbol	Parameter	Min.	Typ.	Max.	Units	Condition
VDD	Logic/LCD Drive Voltage	3.0	3.3	3.6	[V]	-
IDD	VDD Current	-	0.22	-	[A]	Black Pattern, 60Hz
PDD	VDD Power	-	-	1.2	[W]	Black Pattern, 60Hz
Irush	Rush Current	-	-	2.0	[A]	-
VDDrp	Allowable Logic/LCD Drive Ripple Voltage	-	-	200	[mV]p-p	-

Note 1.Measure Condition

Figure 13 VDD rising time
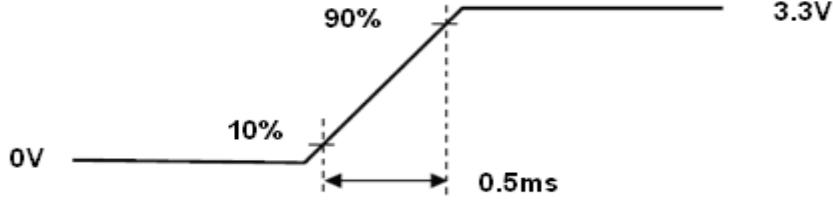
VDD rising time

2. VDD Power Dip Condition

Figure 14 VDD Power Dip
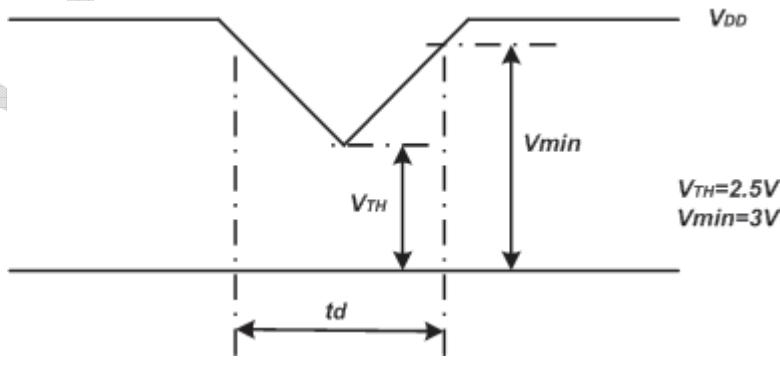
If $V_{TH} < V_{DD} \leq Vmin$，then $t_d \leq 10ms$；When the voltage return to normal our panel must revive automatically.

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9.0 Power ON/OFF Sequence

VDD power on/off sequence is as follows. Interface signals are also shown in the chart. Signals from any system shall be Hi-Z state or low level when VDD is off.

Figure 13 Power Sequence
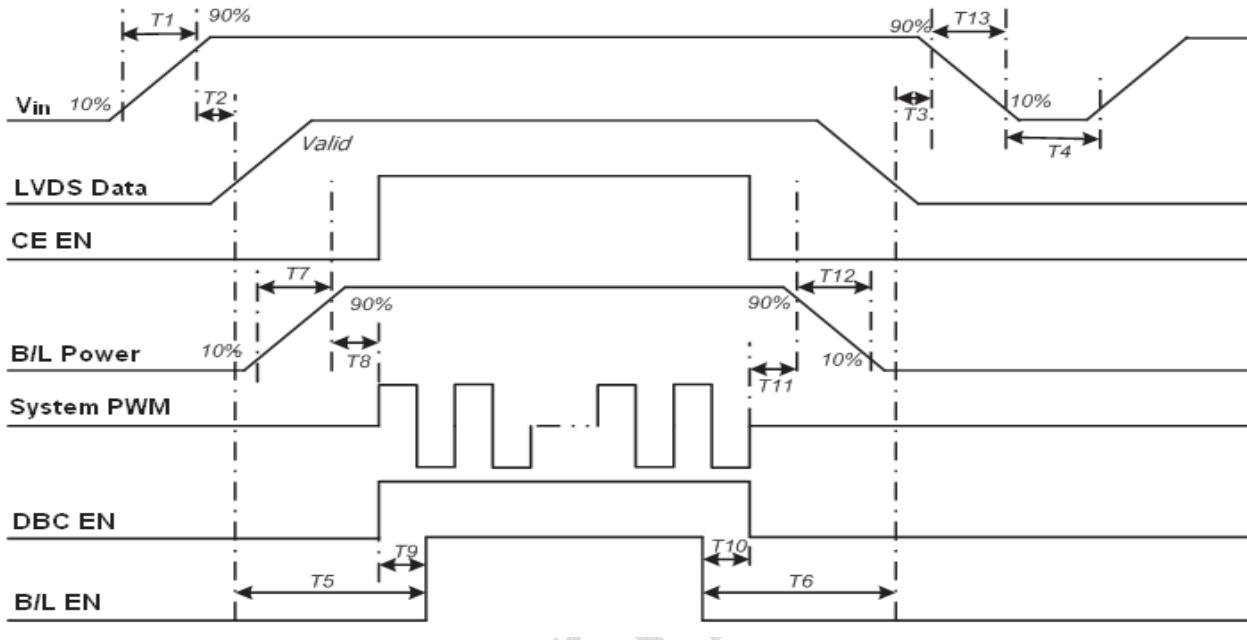
Table 9 Power Sequencing Requirements

Parameter	Unit	Min.	Typ.	Max.
T1	ms	0.5	-	10
T2	ms	0	-	50
T3	ms	0	-	50
T4	ms	500	-	-
T5	ms	200	-	-
T6	ms	200	-	-
T7	ms	0.5	-	10
T8	ms	10	-	-
T9	ms	10	-	-
T10	ms	0	-	-
T11	ms	10	-	-
T12	ms	-	10	30
T13	ms	-	10	30

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10.0   Mechanical Characteristics Connector

Figure 14 Reference Outline Drawing (Front Side)
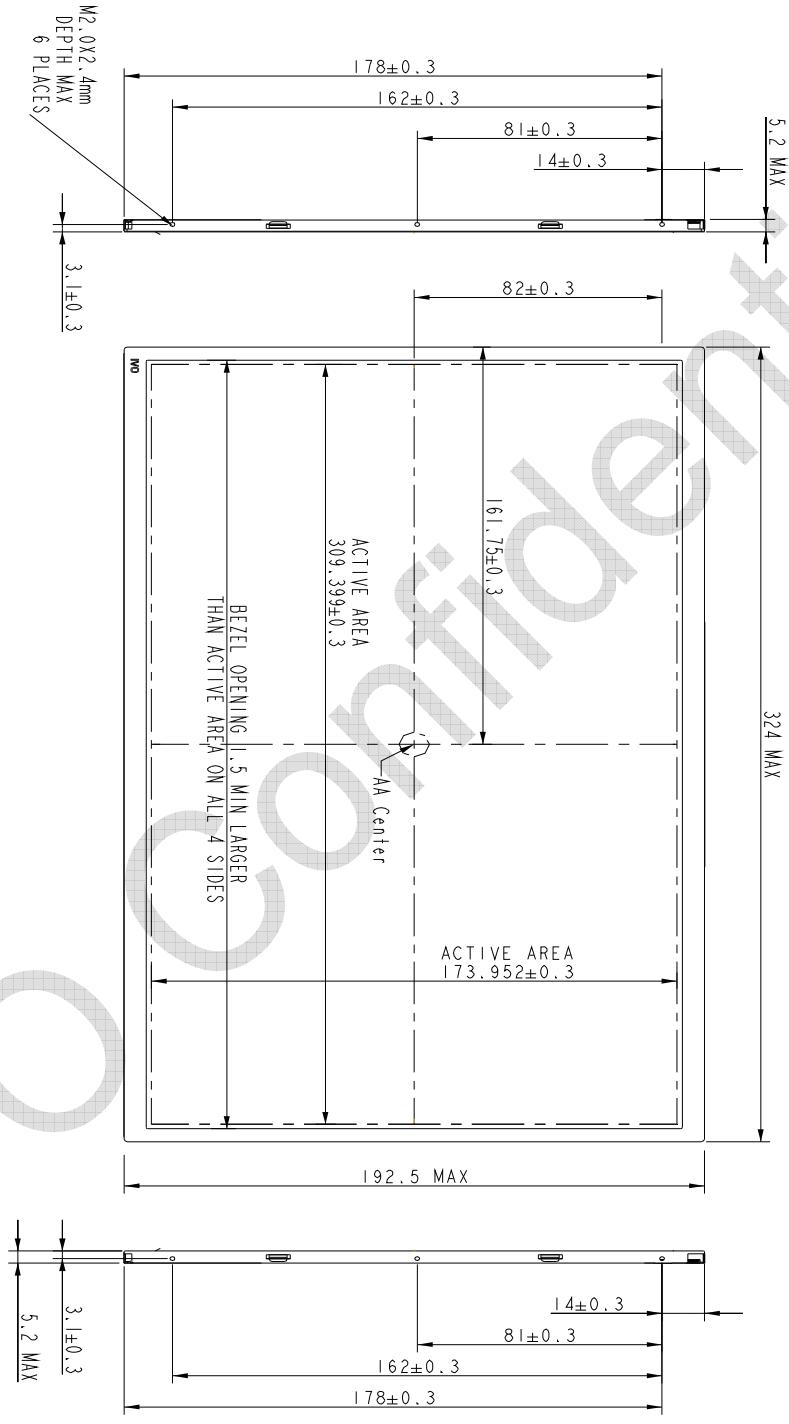
_____
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Figure 15 Reference Outline Drawing (Back Side)
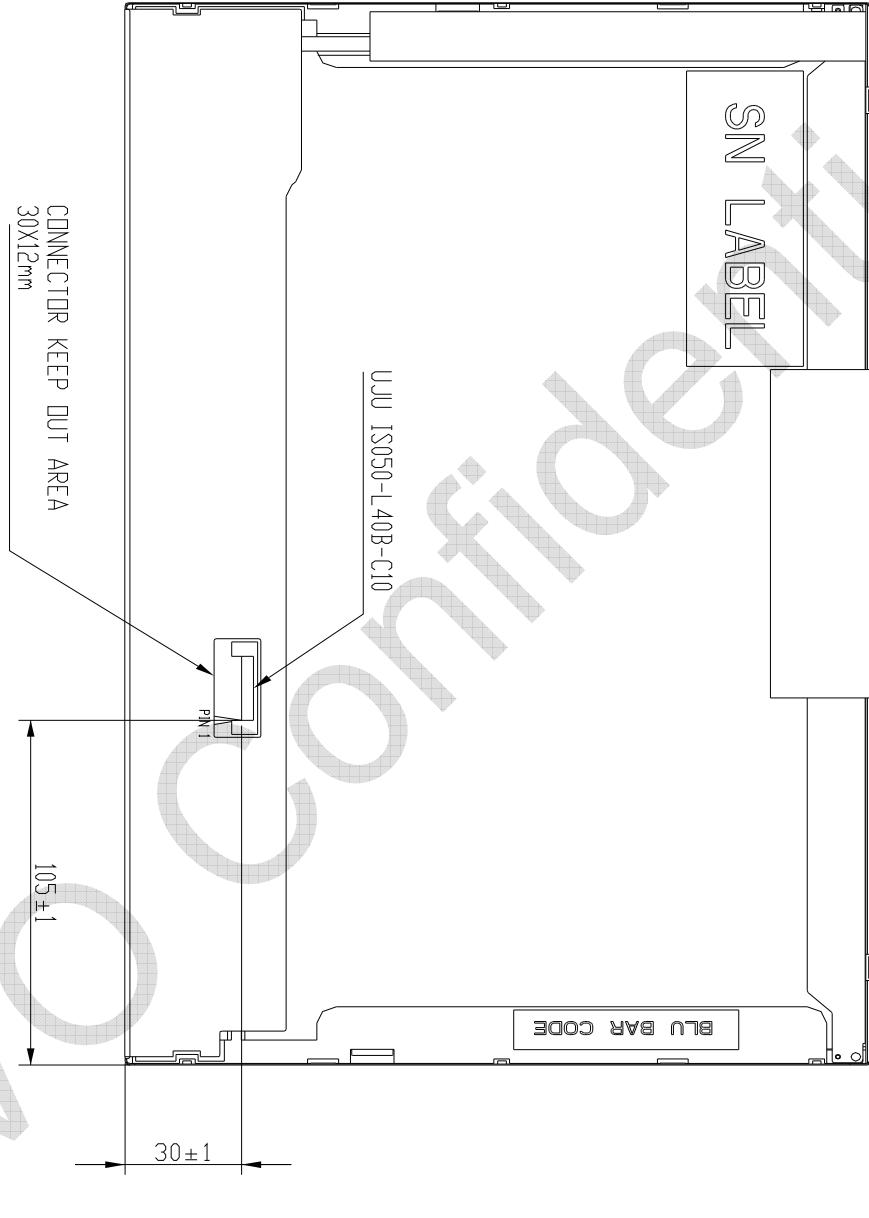
_____
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10.1 Dimension Specifications

Table 10

Width [mm]	323.5 (Typ.), 324.0(Max.)
Height [mm]	192.0(Typ.), 192.5(Max.)
Thickness [mm]	5.2 (Max.)
Weight [g]	350 (Max.)
BM： ｜a-b｜ & ｜c-d｜	≦ 1.0mm

Figure 16
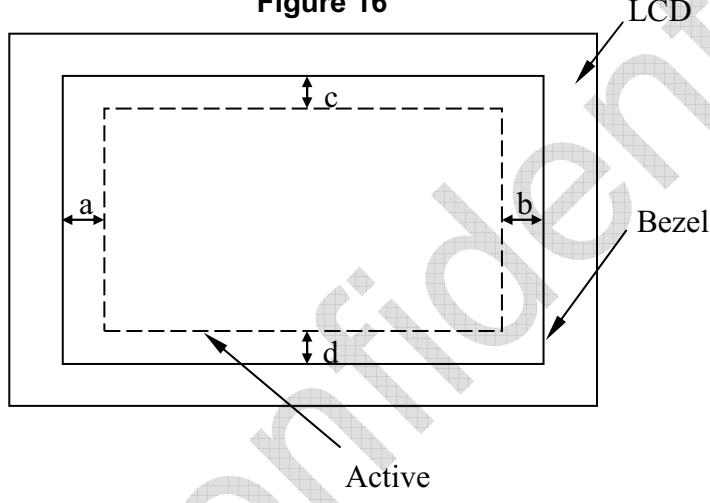
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11.0 Package Specification
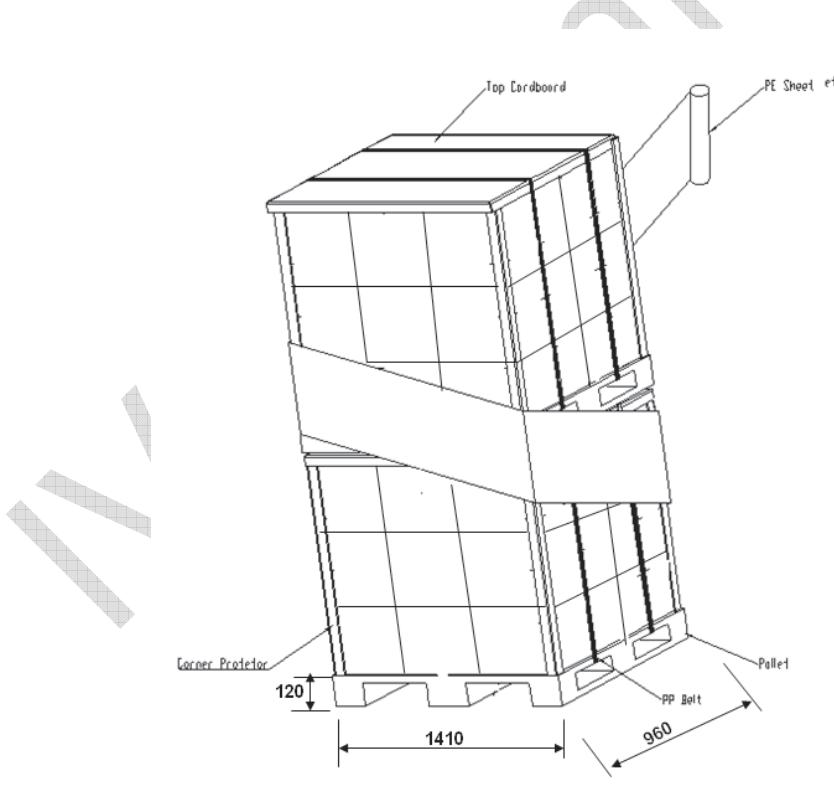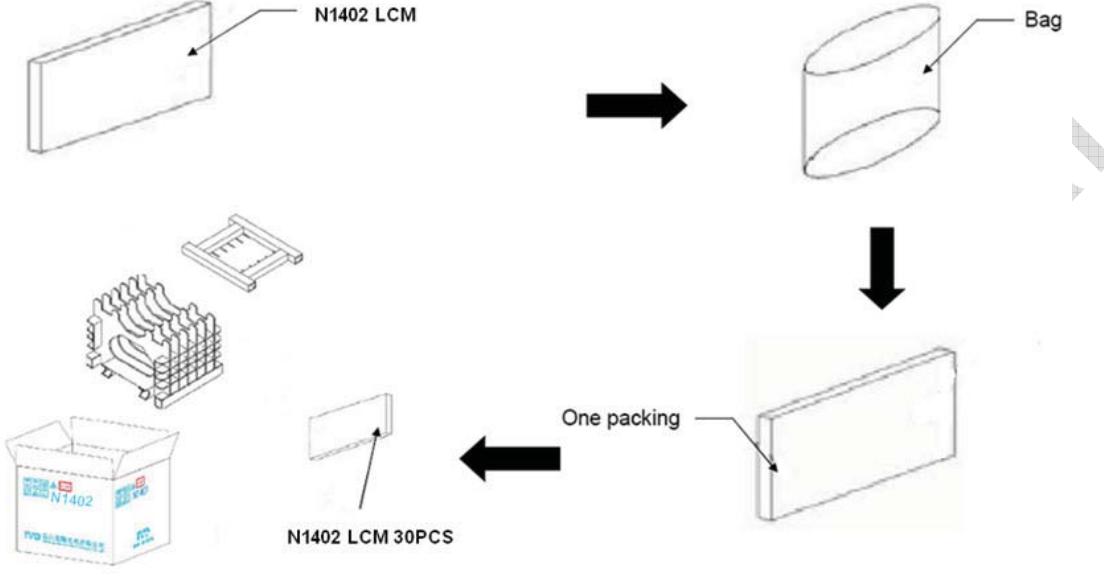
单位：mm

_____

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12.0 Lot Mark

Module Name

Development Product Name

H/W: 2nd Source/ Version

F/W: EDID Version

(NB Product Only)

Lot Mark
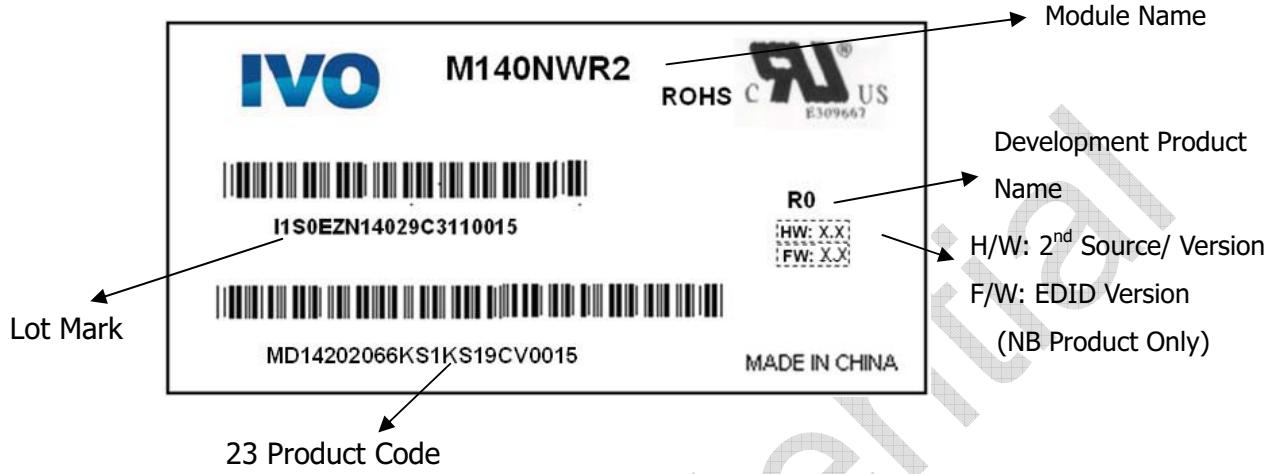
23 Product Code

12.1 Lot Mark

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

code 1,2,4,5,6,7,8,9,10,11,16: IVO internal flow control code.
code 3: Production location.
code 12: Production year.
code 13: Production month.
code 14,15: Production date.
Code 17,18,19,20: Serial number.

Note (1) Production Year

Year	2,006	2,007	2,008	2,009	2,010	2,011	2,012	2,013	2,014	2,015
Mark	6	7	8	9	A	B	C	D	E	F

Note (2) Production Month

Month	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct	Nov.	Dec.
Mark	1	2	3	4	5	6	7	8	9	A	B	C

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12.2   23 Product Barcode

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23

code 1,2:Manufacture District

code 3,4,5,6,7: IVO internal module name.

code 8,9,10,13,16: IVO internal flow control code.

code 11,12: Cell location Suzhou defined as "SZ".

code 14 ,15: Module line kunshan defined as" KS".

code 17,18,19 : Year, Month, Day Refer to Note(1) and Note(2) of Lot Mark.

code 20~23 : Serial Number.

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13.0 General Precaution

13.1 Use Restriction

This product is not authorized for use in life supporting systems, aircraft navigation control systems, military systems and any other application where performance failure could be life-threatening or otherwise catastrophic.

13.2 Handling Precaution

(1) Please mount LCD module by using mounting holes arranged in four corners tightly.

(2) Do not disassemble or modify the module. It may damage sensitive parts inside LCD module, and may cause scratches or dust on the display. IVO does not warrant the module, if customers disassemble or modify the module.

(3) If LCD panel is broken and liquid crystal spills out, do not ingest or inhale liquid Crystal, and do not contact liquid crystal with skin. If liquid crystal contacts mouth or eyes, rinse out with water immediately. If liquid crystal contacts skin or cloths, wash it off immediately with alcohol and Rinse thoroughly with water.

(4) Disconnect power supply before handling LCD module

(5) Refrain from strong mechanical shock and /or any force to the module.

(6) Do not exceed the absolute maximum rating values, such as the supply voltage variation, input voltage variation, variation in parts' parameters, environmental temperature; etc otherwise LCD module may be damaged. It's recommended employing protection circuit for power supply.

(7) Do not touch, push or rub the polarizer with anything harder than HB pencil lead. Use fingerstalls of soft gloves in order to keep clean display quality, when Persons handle the LCD module for incoming inspection or assembly.

(8) When the surface is dusty, please wipe gently with absorbent cotton or other soft Material. When cleaning the adhesives, please use absorbent cotton wetted with a little Petroleum benzene or other adequate solvent.

(9) Wipe off saliva or water drops as soon as possible. If saliva or water drops Contact with polarizer for a long time, they may causes deformation or color Fading.

(10) Protection film must remove very slowly from the surface of LCD module to Prevent from electrostatic occurrence.

(11) Because LCD module uses CMOS-IC on circuit board and TFT-LCD panel, it is Very weak to electrostatic discharge, Please be careful with electrostatic Discharge .Persons who handle the module should be grounded through adequate methods.

(12) Do not adjust the variable resistor located on the module.

13.3 Storage Precaution

(1) Please do not leave LCD module in the environment of high humidity and high temperature for a long time.

(2) The module shall not be exposed under strong light such as direct sunlight. Otherwise, Display characteristics may be changed.

(3) The module should be stored in a dark place. It is prohibited to apply sunlight or fluorescent light in storage.

13.4 Operation Precaution

(1) Do not connect or disconnect the module in the "Power On" condition.

(2) Power supply should always be turned on/off by 9.0 "Power on/off sequence"

(3) Module has high frequency circuits. Sufficient suppression to the electromagnetic interference should be done by system manufacturers. Grounding and shielding methods may

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be important to minimize the interference.

(4) After installation of the TFT Module into an enclosure, do not twist nor bend the TFT Module even momentary. At designing the enclosure, it should be taken into consideration that no bending/twisting forces are applied to the TFT Module from outside. Otherwise the TFT Module may be damaged.

13.5 Others

(1) Ultra-violet ray filter is necessary for outdoor operation.

(2) Avoid condensation of water which may result in improper operation or disconnection of electrode.

(3) If the module keeps displaying the same pattern for a long period of time, the image may be "sticked" to the screen.

(4) This module has its circuitry PCB's on the rear side and should be handled carefully in order not to be stressed.

13.6 Disposal

When disposing LCD module, obey the local environmental regulations.

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13.0   EDID Data Structure

Address (Decimal)	Address (HEX)	Field Name & Comments	Value (HEX)	Value (BIN)	Value (DEC)
0	0	Header	00	00000000	0
1	1	Header	FF	11111111	255
2	2	Header	FF	11111111	255
3	3	Header	FF	11111111	255
4	4	Header	FF	11111111	255
5	5	Header	FF	11111111	255
6	6	Header	FF	11111111	255
7	7	Header	00	00000000	0
8	8	manufacture code	26	00100110	38
9	9	manufacture code	CF	11001111	207
10	0A	Product Code	7A	01111010	122
11	0B	Product Code	05	00000101	5
12	0C	LCD module Serial No –("0" if not used)	01	00000001	1
13	0D	LCD module Serial No –("0" if not used)	00	00000000	0
14	0E	LCD module Serial No –("0" if not used)	00	00000000	0
15	0F	LCD module Serial No –("0" if not used)	00	00000000	0
16	10	Week of manufacture	06	00000110	6
17	11	Year of manufacture	14	00010100	20
18	12	EDID Structure Ver # = 1	01	00000001	1
19	13	EDID revision # = 3	03	00000011	3
20	14	Video I/P definition = Digital I/P (80h)	80	10000000	128
21	15	Max H image size = (Rounded to cm)	1F	00011111	31
22	16	Max V image size = (Rounded to cm)	11	00010001	17
23	17	Display Gamma	78	01111000	120
24	18	Feature support (no DPMS, Active off, RGB, timing BLK 1)	0A	00001010	10
25	19	Red/Green Low bits (RxRy/GxGy)	13	00010011	19
26	1A	Blue/White Low bits (BxBy/WxWy)	60	01100000	96
27	1B	Red X Rx	97	10010111	151
28	1C	Red Y Ry	58	01011000	88
29	1D	Green X Gx	57	01010111	87
30	1E	Green Y Gy	91	10010001	145
31	1F	Blue X Bx	26	00100110	38
32	20	Blue Y By	1E	00011110	30
33	21	White X Wx	50	01010000	80
34	22	White Y Wy	54	01010100	84
35	23	Established timings 1 (00h if not used)	00	00000000	0
36	24	Established timing 2 (00h if not used)	00	00000000	0
37	25	Manufacturer's timings (00h if not used)	00	00000000	0
38	26	Standard timing ID1 (01h if not used)	01	00000001	1
39	27	Standard timing ID1 (01h if not used)	01	00000001	1
40	28	Standard timing ID2 (01h if not used)	01	00000001	1
41	29	Standard timing ID2 (01h if not used)	01	00000001	1
42	2A	Standard timing ID3 (01h if not used)	01	00000001	1
43	2B	Standard timing ID3 (01h if not used)	01	00000001	1

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44	2C	Standard timing ID4 (01h if not used)	01	00000001	1
45	2D	Standard timing ID4 (01h if not used)	01	00000001	1
46	2E	Standard timing ID5 (01h if not used)	01	00000001	1
47	2F	Standard timing ID5 (01h if not used)	01	00000001	1
48	30	Standard timing ID6 (01h if not used)	01	00000001	1
49	31	Standard timing ID6 (01h if not used)	01	00000001	1
50	32	Standard timing ID7 (01h if not used)	01	00000001	1
51	33	Standard timing ID7 (01h if not used)	01	00000001	1
52	34	Standard timing ID8 (01h if not used)	01	00000001	1
53	35	Standard timing ID8 (01h if not used)	01	00000001	1
54	36	Pixel Clock LSB	6E	01101110	110
55	37	Pixel Clock HSB	1E	00011110	30
56	38	Horizontal Active (lower 8 bits)	56	01010110	86
57	39	Hor blanking (lower 8 bits)	F0	11110000	240
58	3A	Horizontal Active/Horizontal blanking (upper4:4 bits)	50	01010000	80
59	3B	Vertcal active(lower 8 bits)	00	00000000	0
60	3C	Vertical blanking(lower 8 bits)	28	00101000	40
61	3D	Vertical Active : Vertical Blanking (upper4:4 bits)	30	00110000	48
62	3E	Horizontal Sync Offset	30	00110000	48
63	3F	Horizontal Sync Pulse Width	20	00100000	32
64	40	Vertical Sync Offset , Sync Width	3C	00111100	60
65	41	Horizontal Vertical Sync Offset/Width upper 2 bits	00	00000000	0
66	42	Horizontal Image Size	35	00110101	53
67	43	Vertical image Size	AE	10101110	174
68	44	Horizontal Image Size / Vertical image size	10	00010000	16
69	45	Horizontal Border = (0 for Notebook LCD)	00	00000000	0
70	46	Vertical Border = (0 for Notebook LCD)	00	00000000	0
71	47	Non-interlaced, Normal, no stereo, Separate sync, H/V pol Negatives,	19	00011001	25
72	48	Timing Descriptor #2	00	00000000	0
73	49		00	00000000	0
74	4A		00	00000000	0
75	4B		0F	00001111	15
76	4C		00	00000000	0
77	4D		00	00000000	0
78	4E		00	00000000	0
79	4F		00	00000000	0
80	50		00	00000000	0
81	51		00	00000000	0
82	52		00	00000000	0
83	53		00	00000000	0
84	54		00	00000000	0
85	55		00	00000000	0
86	56		00	00000000	0
87	57		00	00000000	0

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88	58		00	00000000	0
89	59	Module revision	01	00000001	1
90	5A	Detailed timing/monitor descriptor#3	00	00000000	0
91	5B	Flag	00	00000000	0
92	5C	Flag	00	00000000	0
93	5D	FE (hex) defines ASCII string	FE	11111110	254
94	5E	Flag	00	00000000	0
95	5F	Manufacture I	49	01001001	73
96	60	Manufacture n	6E	01101110	110
97	61	Manufacture f	66	01100110	102
98	62	Manufacture o	6F	01101111	111
99	63	Manufacture V	56	01010110	86
100	64	Manufacture i	69	01101001	105
101	65	Manufacture s	73	01110011	115
102	66	Manufacture i	69	01101001	105
103	67	Manufacture o	6F	01101111	111
104	68	Manufacture n	6E	01101110	110
105	69	New line character indicates end of ASCII string	0A	00001010	10
106	6A		20	00100000	32
107	6B		20	00100000	32
108	6C	Detailed timing/monitor descriptor #4	00	00000000	0
109	6D		00	00000000	0
110	6E		00	00000000	0
111	6F	FE (hex) defines ASCII string	FE	11111110	254
112	70	Flag	00	00000000	0
113	71	Manufacture P/N	4D	01001101	77
114	72	Manufacture P/N	31	00110001	49
115	73	Manufacture P/N	34	00110100	52
116	74	Manufacture P/N	30	00110000	48
117	75	Manufacture P/N	4E	01001110	78
118	76	Manufacture P/N	57	01010111	87
119	77	Manufacture P/N	52	01010010	82
120	78	Manufacture P/N	32	00110010	50
121	79	Manufacture P/N	20	00100000	32
122	7A	Manufacture P/N	52	01010010	82
123	7B	Manufacture P/N	30	00110000	48
124	7C	New line character indicates end of ASCII string	20	00100000	32
125	7D		0A	00001010	10
126	7E	Extension Flag = 00	00	00000000	0
127	7F	Checksum	BC	10111100	188

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